

TACKLE Technology

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PDAs and PCs are a growing part of hospital practice

| By Larry Beresford

Dennis Deruelle, MD, a hospitalist at University Community Hospital in Tampa, Fla., once needed reliable medical information in a hurry while treating a young woman admitted to the hospital with cellulitis.

The woman was later diagnosed with methicillin-resistant staphylococcus aureus (MRSA). After Dr. Deruelle administered prochlorperazine (Compazine), she had a severe dystonic reaction.

"She was going rigid right before my eyes," Dr. Deruelle says. There was no instantly accessible hospital clearinghouse of medical information, although he had called the pharmacy department

and was waiting for a call back. So he opened his laptop and turned to an aid available to anyone with a computer and Internet access: Google. "I immediately looked up information on reactions to Compazine and the correct dose for counteracting it. I administered the dose, and within minutes [the patient] was getting better."

Dr. Deruelle is not alone among physicians in answering medical questions with Google. (See *The Hospitalist*, July 2007, p. 33.)

He has been interested in medical applications of computer technology for years and serves on SHM's advisory

committee on technology. He receives tech support from his employer, IPC—The Hospitalist Company, based in North Hollywood, Calif. IPC offers its physicians a Web-accessible network called IPC Link—a "virtual office" to help with billing, medical decision support, reference software, continuing medical education, and even blogs written by company CEO Adam Singer, MD.

But Dr. Deruelle has also developed his own applications, including an off-the-shelf voice recognition software loaded onto his company-supplied, 2.5-lb. Tablet PC. He uses it to dictate brief

notes to give attending physicians a heads-up about patients being discharged. These notes are uploaded to the company's network, which automatically generates a fax to the attending within minutes.

The formal discharge summary, produced by the hospital's medical transcription department, may take 48 hours to arrive.

Dr. Deruelle has wireless Internet access at four of the five hospitals he visits as a hospitalist practice leader.

"As soon as I walk in the door I'm 'hot,'" he says. At the fifth hospital, he uses workstation computers to connect

with IPC Link.

Array of Options

A dizzying range of communications technology is available to working hospitalists, typically accessed through personal digital assistants (PDAs), smartphones, computer tablets, pocket PCs, and laptops.

The Palm Pilot, introduced in 1996, is a well-known example of this technology, as are the Palm Treo and BlackBerry. PDAs combine the functions of cell phones, video phones, cameras, video recorders, media players, Web browsers, reference tools, bar code scanners, and global positioning system (GPS) devices—all in a palm-size package.

Hardware and supporting software vary in terms of ease of use, in particular, the ability to interface with the Web or the hospital, practice, or employer network the physician needs to connect with.

The technology is evolving rapidly. But anomalies abound, such as dependence on the fax machine as a staple of communication with attending physicians. Through all of these changes, hospitalists are responsible for learning what works and how best to take advantage of the technology to make their jobs easier.

Hospitalists also vary tremendously in terms of their comfort levels and openness to new technology.

“There is a considerable gap between those of us who ‘Palm’ and those who don’t,” says Timothy Hartzog, MD, pediatric hospitalist at Medical University of South Carolina (MUSC) in Charleston and a medical technology consultant. “Physicians want their patient data in different ways. Some want it printed out or in a paper chart.”

But implementation of technology, such as hospital electronic health records or computerized physician order entry, inevitably changes their relationships with information technology and patient information.

Some hospitalists, like Dr. Deruelle, are interested in what communication technology can bring their work and how to adapt it to their needs. Others, like Dr. Hartzog, medical director of Information Technology at MUSC, have taken added responsibilities for technology within their institutions.

And a few, such as Steven Liu, MD, of Emory University Medical Center in Atlanta, have taken their interest in computer technology a step further. In 1999, Dr. Liu founded Ingenious Med, an Atlanta software company that offers a suite of inpatient practice management applications to working hospitalists.

“Often the hospitalist is already on the forefront of technology,” Dr. Liu says. “The demographic is typically younger and techno-savvy. They may get tapped by their hospitals to help customize the electronic health record to make sure it satisfies the needs of clinicians. Conversely, if an electronic project does not involve strong physician feedback and collaboration, physicians can be the Achilles’ heel impeding successful implementation. Even though

HOW HOSPITALISTS USE TECHNOLOGY

Hospitalists have plenty of ways to use communications technology, such as PDAs or laptops, to make their daily practices more efficient.

- Communicating with attending physicians, both formal admission/discharge summaries and briefer discharge notes or daily progress notes with immediately relevant information, entered on personal computing devices and delivered to the physician's office fax machine the same day;
- Communicating within the hospitalist practice regarding practice business and scheduling but also for daily sign-outs and hand-offs to evening or on-call shifts;
- Handling routine daily business, including personal organizers, schedules, to-do lists, rounding notes, current patient rosters, and other “personal clipboard” data such as lab results for active patients;
- Managing billing functions, including billing codes, charge

captures, and audits for completeness and accuracy;

- Using reference applications, including a variety of electronic medical textbooks, pharmacopoeias, and other informational databases and Web resources that can be accessed on a PDA or over the Internet;
- Using decision support alerts;
- Interfacing with the hospital's electronic health record, computerized physician order entry, and other information systems. As quality and outcomes measurement requirements grow, PDAs and laptops will be used for reporting the data;
- Using calculator functions, including important medical value calculations supported by software applications; and
- Text messaging, a quick way to get a simple question into the hands of a colleague when a prompt reply is needed.—LB

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—Steven Liu, MD, of Emory University Medical Center in Atlanta

they are the ones who stand to gain most from the potential efficiency, physicians will not adopt technology that does not fit their workflow.”

State of the Art?

Russell Cucina, MD, MS, a hospitalist at the University of California-San Francisco Medical Center, San Francisco, is also the associate medical director for information technology at UCSF.

Dr. Cucina quips that a good example of a state-of-the-art, stand-alone patient data management system offering rapid data entry, long battery life, and high mobility is the paper index card, the longtime standard for making rounding notes.

“Plenty of doctors, including me, use it every day,” he says. But growing numbers of hospitalists also use PDAs, smartphones, and laptops to access information and support applications. Among the plethora of reference applications readily available to physicians by PDA or laptop are UpToDate, Epocrates, the Pocket Sanford Guide to Anti-Microbial Therapy, and Merck Medicus.

“I use many different resources as a hospitalist,” Dr. Cucina says. “I Google all the time.” Hospitalists still have opportunities to innovate, although increasingly their “home-grown” solutions will compete with multinational technology conglomerates entering the medical market.

The use of technology and equipment also varies depending on whether the hospitalist is employed by the hospital or part of an independent medical group.

Another factor is whether that hospital is academic, community-based, or part of a system like the Veterans Affairs or a staff-model HMO such as Kaiser Permanente. But all hospitalists are used to working on the run, Dr. Cucina says. And in their daily jobs, workflow is everything.

Tech in Use

“I use medical technology on the job to a moderate degree,” reports Latha Sivaprasad, MD, a hospitalist at Beth Israel Medical Center in New York City. “This is my sixth year working as a hospitalist, and for the first five years I didn’t use a specific device. Now I have a Palm-based program with MD Everywhere, Epocrates, UpToDate, and the ability to do billing. The hospital’s tech support staff trained us on the new system and how to use the PDA for tasks like developing rounding lists, accessing our colleagues’ lists and creating system-based memos.”

Dr. Sivaprasad also has GPS in her car, a cell phone, and a laptop at home. “We probably aren’t using medical technology as much as we could,” she says. “Many physicians still write prescriptions by hand. I’ve never used voice-recognition software. In a previous hospital, we used the hospital’s transcription service for dictated notes.”

Karim Godamunne, MD, MBA, a hospitalist with Eagle Hospital Physicians and a practice medical director at South Fulton Medical Center in Atlanta, uses a PDA at work for billing.

“I don’t use the PDA intensively,” he says. “I’d like to see our hospital create a wireless network like the one I have at home. Our sister hospital has wireless.” He notes, however, that there are computer workstations for him to use at his hospital.

Dr. Godamunne’s group has a practice coordinator who faxes discharge summaries to attending physicians.

“Fax is kind of what they expect these days,” he says. “I’m not sure e-mail would be as reliable for the community we serve. I’d be concerned that the

JUMP ON THE TECH WAVE

Learn more about information and communications technology.

- Take courses offered by the American College of Physician Executives (www.acpe.org) and the American Medical Informatics Association (www.amia.org), which several times a year presents Introduction to Health Informatics, an intensive 11-unit Web-based course followed by an intensive one-day in-person session.
- Visit Doctors Gadgets (www.doctorsgadgets.com), which provides a forum for discussing advances in personal technology for physicians, including hand-held computing, smartphones and tablet PCs; and
- Appoint one physician within the hospitalist group to represent the group in technology discussions within the hospital. The hospitalist liaison to IT needs to be compensated for the time required and should have some prior interest in technology and/or a willingness to learn.—LB

attendings wouldn't read their e-mails." He says he sometimes gives written notes to patients at discharge with instructions to hand the note to their physician on their next office visit.

Michelle Pezzani, MD, is part of a 10-member hospital medicine group that practices at El Camino Hospital in Mountain View, Calif., in the heart of Silicon Valley. The hospital tries to stay on the cutting edge with technology, and its hospitalists were given Microsoft XP Tablet laptops a few years ago. "I access the Web two to four times a day at work," Dr. Pezzani says. "It helps keep us current. The great thing about the laptop is I also take it home with me, and I can use it to check or reorder labs from home. We're all connected to the hospital's Intranet from home."

"One of the issues we're struggling with is how to achieve the best sign-out possible," with up to four hospitalists on the day shift checking out and handing over patient responsibilities to the night shift, Dr. Pezzani says. For her, the ideal sign-out is face to face because it permits asking questions and reading nonverbal cues about how sick the patients really are. However, the logistics of multiple physicians and patients makes this ideal difficult to achieve.

Second best (if all group members used a Palm Pilot), would be to send sign-outs via text messaging—although that would also present logistical challenges. "Texting is easier," she says. "You know who is sending the message. We could beam the written sign-out to each

other in a matter of seconds, making it quick and easy. Furthermore, any day-to-day changes on a specific patient would be easy to amend and easy to send. It's also a quick way to let a colleague know, 'I need you right now!'"

The hospitalists at El Camino use voicemail to record sign-outs. But these messages can take a long time to record and play back, multiplied by the four physicians signing out. "Ideally, there would be a different voice mail for every patient, so I wouldn't have to listen to patients A, B, C, D, and E to get to the pertinent information about patient F, who is crashing upstairs," she says. Dr. Pezzani's group is still exploring how to balance these considerations.

She says her hospitalist group is tight-knit and collaborative. "We leave our cell phones on all the time and answer each other's calls after hours," she says. "For example, I'm now on vacation with my family in San Diego and I have gotten at least two calls a day from my partners, either business related, or something like: 'Do you remember that patient you admitted? Can you give me some information on them?'"

The Wired Hospital

Dr. Cucina is excited about the extra large, easy-to-grip handle on the 3-lb. Motion Computing C5 portable PC that UCSF hospitalists are field-testing. He's also intrigued by the ever-expanding opportunities for interfacing with the hospital's technology.

In August he gave a tour of Unit

13L at UCSF's Moffitt/Long Hospital, a new ward that opened in June and is being used as a technology demonstration site.

The 32-bed unit has a narrow corridor lined with 10 computer workstations for the nurses. All 10 are in use. In an adjacent cubicle, several physicians are typing on their laptops.

On the unit, portable vital signs monitors are attached to rolling stands that also have docking ports for the laptops, offering real-time point-of-care acquisition of vital-signs data directly into the hospital's medical record.

A nurse or physician can grab the big-handled Tablet PC and run to another room while remaining connected to the patient's vital signs. The docking ports in patients' rooms are also linked to a 37-inch, high-definition television. "A clinician can show the patient radiographic studies here or bring up interactive patient education programs," he explains.

One of the most exciting potentials

for this emerging technology is to find ways for embedding medical decision support in physicians' workflow. "We know that the barriers to physicians routinely consulting decision support applications are high," Dr. Cucina says.

For Dr. Deruelle, who had to look outside of hospital channels to answer his question about a dystonic patient, medicine has a serious information gap. "I believe we will move to where the technology will put that information at my fingertips," he says. "Why aren't we there yet? Not enough people are using the technology, and we don't agree on what information should be included. But I think we can start with basic things and work up from there. What excites me is that we're closing the information gap—although medicine is still in the Stone Age compared with other professions." **TH**

Larry Beresford is a frequent contributor to *The Hospitalist*.

E-MAIL ISSUES

Legal concerns have been raised about sending patient-specific information by e-mail that has not been encrypted, even when initiated by the patient.

Experts point out that exchanging e-mails containing patient-specific information could violate the Health Insurance Portability and Accountability Act's security

requirements, unless both physicians are part of the same secure system or use a Web portal like Relay Health that offers encryption for its subscribers. With some hospitals offering wireless access to patients and their family visitors, e-mail could have a positive role in doctor-patient communication.—**LB**



RENEWAL



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